

REMARKS**I. INTRODUCTION**

Claims 14, 15 and 18-20 have been amended. Claims 56-72 have been withdrawn as being directed to non-elected subject matter. Support for the amendments to the claims can be found throughout the original specification of the underlying PCT application and in the drawings. (See, e.g., Substitute Specification, paras. [0025] and [0037], and Fig. 1). Applicants reserve the right to prosecute the non-elected claims and any other claims supported by the specification of the present application in one or more continuing applications which would claims priority from the present application. Accordingly, claims 14-55 are under consideration in the above-referenced application. Provided above, please find a claim listing indicating the current amendments to claims 14, 15 and 18-20. Applicants respectfully assert that the amendments to claims 14, 15 and 18-20 fully comply with the requirements set forth in 37 C.F.R. § 1.121. It is respectfully submitted that no new matter has been added.

II. REJECTION UNDER 35 U.S.C. § 112 SHOULD BE WITHDRAWN

Claims 18-20 stand rejected under 35 U.S.C. § 112, second paragraph as being allegedly indefinite. In the Office Action, the Examiner alleges that the term “predetermined” in these claims is a relative term, and for that reason allegedly renders these claims indefinite. In addition, the Examiner states that the “fracture ratio is indefinite in view of the claim limitations” in these claim because claims 18-20 do not state that the ultrasonic wave is necessary in the presence of the catalyst support. (Office Action, p. 2, para. 2).

As an initial matter, while Applicants respectfully disagree that relative terms in the claims render such claims indefinite, claims 18-20 have been amended herewith to change the phrase “predetermined time period” to recite “approximately 4 hours.” Exemplary support for such amendment to claims 18-20 can be found throughout the original specification of the underlying PCT application. (See, e.g., Substitute Specification, p. 12, para. [0037], Ins. 22-27).

Further, the requirement contended by the Examiner in the Office Action regarding the alleged need to include the recitation of the ultrasonic wave in the presence of the catalyst support in claims 18-20 is inappropriate. Indeed, no such recitations are necessary, as the actual language of the claims provides sufficient metes and bounds for the claims subject matter therein, and clearly recites that the catalyst has “a fractured or pulverized ratio of at most 10% when an ultrasonic wave is emitted for approximately 4 hours at a room temperature to the catalyst dispersed in water.” Indeed, there is no statutory or regulatory requirements to include such subject matter the claims of the present application.

For at least these reasons, Applicants respectfully request that the rejection under 35 U.S.C. § 112, second paragraph be withdrawn.

III. REJECTIONS UNDER 35 U.S.C. §§ 102(b) AND 103(a) SHOULD BE WITHDRAWN

Claims 14-27 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 3,969,274 issued to Frampton (the “Frampton Patent”).¹ Claims 18-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Frampton Patent, in view of U.S. Patent No. 5,604,170 issued to Sano et al. (the “Sano Patent”). Claims 28-31, 35-38, 42-45 and 49-52 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Frampton Patent, in view of U.S. Patent No. 4,154,751 issued to McVicker (the “McVicker Patent”). Claims 32-34, 39-41, 46-48 and 53-55 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Frampton Patent, in view of the Sano Patent, and in further view of the McVicker Patent. For at least the reasons set forth herein below, Applicants respectfully assert that amended independent claims 14 and 15, and the claims which depend therefrom, are not rendered obvious or anticipated by the Frampton Patent, or rendered obvious by the alleged combination of the Frampton Patent with the Sano Patent and/or the McVicker Patent.

In order for a claim to be rejected as anticipated under 35 U.S.C. § 102, each and every element as set forth in the claim must be found, either expressly or inherently described, in a single prior art reference. Manual of Patent Examining Procedures, §2131; also see *Lindeman Maschinenfabrik v. Am Hoist and Derrick*, 730 F.2d 1452, 1458 (Fed. Cir. 1984).

¹ In the Office Action, the Examiner stated that claims 14-27 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by the Frampton Patent. However, it appears from the details of the Examiner’s comments provided for this rejection that the Examiner intended to reject only claims 14-17 and 21-27 as being allegedly anticipated by the Frampton Patent as no comments regarding claims 18-20 were included in this rejection providing in the Office Action. Thus, Applicants will proceed with such understanding.

Under 35 U.S.C. § 103(a), a person is not entitled to a patent even though the invention is not identically disclosed or described as set forth in §102, “if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103(a).

The objective standard for determining obviousness under 35 U.S.C. § 103, as set forth in *Graham v. John Deere, Co.*, 383 U.S. 1 (1966), requires a factual determination to ascertain: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; and (3) the differences between the claimed subject matter and the prior art. Based on these factual inquiries, it must then be determined, as a matter of law, whether or not the claimed subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the alleged invention was made. *Graham*, 383 U.S. at 17. Courts have held that there must be some suggestion, motivation or teaching of the desirability of making the combination claimed by the applicant (the “TSM test”). See *In re Beattie*, 974 F.2d 1309, 1311-12 (Fed. Cir. 1992). This suggestion or motivation may be derived from the prior art itself, including references or disclosures that are known to be of special interest or importance in the field, or from the nature of the problem to be solved. *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573 (Fed. Cir. 1996).

Although the Supreme Court criticized the Federal Circuit’s application of the TSM test, see *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741, (2007) the Court also indicated that the TSM test is not inconsistent with the *Graham* analysis

recited in the *Graham v. John Deere* decision. *Id.*; see *In re Translogic Technology, Inc.*, No. 2006-1192, 2007 U.S. App. LEXIS 23969, *21 (October 12, 2007). Further, the Court underscored that “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” *KSR*, 127 S. Ct. at 1741. Under the precedent established in *KSR*, however, the presence or absence of a teaching, suggestion, or motivation to make the claimed invention is merely one factor that may be weighed during the obviousness determination. *Id.* Accordingly, the TSM test should be applied from the perspective of a person of ordinary skill in the art and not the patentee, but that person is creative and not an automaton, constrained by a rigid framework. *Id.* at 1742. However, “the reference[s] must be viewed without the benefit of hindsight afforded to the disclosure.” *In re Paulsen*, 30 F.3d 1475, 1482 (Fed. Cir. 1994).

The prior art cited in an obviousness determination should create a reasonable expectation, but not an absolute prediction, of success in producing the claimed invention. *In re O’Farrell*, 853 F.2d. 894, 903-04 (Fed. Cir. 1988). Both the suggestion and the expectation of success must be in the prior art, not in applicant’s disclosure. *Amgen, Inc. v. Chugai Pharmaceutical Co., Ltd.*, 927 F.2d 1200, 1207 (Fed. Cir. 1991) (citing *In re Dow Chem. Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988)). Further, the implicit and inherent teachings of a prior art reference may be considered under a Section 103 analysis. See *In re Napier*, 55 F.3d 610, 613 (Fed. Cir. 1995).

Secondary considerations such as commercial success, long-felt but unsolved needs, failure of others, and unexpected results, if present, can also be considered. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538-39 (Fed. Cir. 1983).

Although these factors can be considered, they do not control the obviousness conclusion. *Newell Cos. v. Kenney Mfg. Co.*, 864 F.2d 757, 768 (Fed. Cir. 1988). The Frampton Patent relates to a fixed bed catalyst which includes an active catalyst material supported on a particular type of porous silica xerogel which has been treated with steam under particular temperature conditions. (See Frampton Patent, Abstract). The xerogel of the Frampton Patent contains SiO₂ over 99wt%, and Na₂O 0.02-0.09 wt%. (See *id.*, claim 2). For example, the Frampton Patent describes a catalyst containing Fe, Ni, Co and Ru.

The Sano Patent relates to a catalyst carrier for use in the polymerization of olefins. The carrier comprises particles of silicon oxide or aluminum oxide with (a) an average particle diameter as measured by the sieving method is in the range of 20 to 150 μm , (b) a specific surface area as measured by the BET method is in the range of 150 to 600 m^2/g . (C) a volume of pores ranging in pore radius from 18 to 1,000 Angstroms as measured by the mercury penetration method is in the range of 0.3 to 2.0 cm^3/g , (d) an apparent specific gravity is not lower than 0.32, (e) After the particles classified in the range of between 53 μm and 75 μm by the sieving method have been subjected to an ultrasonic disintegration treatment at 40 KHz, 35 W, for 20 minutes, the proportion of 50 μm or smaller particles, is not more than 30%. (See Sano Patent, Abstract and claim 1).

The McVicker Patent relates to supported potassium (or rubidium)-Group VIII-metal cluster catalysts which are useful in CO/H₂ reactions (Fischer-Tropsch synthesis reactions). The catalysts are prepared by depositing well characterized potassium (or rubidium)-Group VIII-metal carbonyl cluster complexes onto high surface

area supports. (See McVicker Patent, Abstract). The catalyst of the McVicker Patent contains 2.2% potassium (alkali metal) and Fe.

A. Independent Claims 14 and 15 and Claims which Depend Therefrom

Applicants' invention, as recited in amended independent claim 14, relates to catalyst for producing hydrocarbon from a syngas which comprises, *inter alia*, a catalyst support on which a metallic compound is loaded, whereas **an alkali metal or an alkaline earth metal content in the catalyst support is in range of between approximately 0.01 mass% and 0.07 mass%**. Further, Applicants' invention, as recited in amended independent claim 15, relates to catalyst for producing hydrocarbon from a syngas which comprises, *inter alia*, a catalyst support on which a metallic compound is loaded, whereas **an alkali metal or an alkaline earth metal content in the catalyst support is in range of between approximately 0.01 mass% and 0.04 mass%**.

It is respectfully asserted that the Frampton Patent fails to teach, suggest or disclose at least such recited subject matter of independent claims 14 and 15. Indeed, the Frampton Patent does not even mention any alkali metal content or an alkaline earth content *in the catalyst support* having any such claimed ranges, i.e., *between approximately 0.01 mass% and 0.07 mass%* (as recited in claim 14) or *between approximately 0.01 mass% and 0.04 mass%* (as recited in claim 15).

In particular, Applicants respectfully assert that the Frampton Patent provides neither teaching nor suggestion showing how reaction activity changes when Na₂O content provided in the material is in a range from about 0.02 to 0.09 wt%.

Moreover, there is neither teaching nor suggestion showing that the reaction activity (e.g., CO conversion, etc.) significantly increases when the sodium content is about 700 ppm (0.07 mass%) or less, and 400 ppm (0.04 mass%) or less. At least for these reasons, it is respectfully submitted that the Frampton Patent does not disclose that an alkali metal content or an alkaline-earth metal content in the catalyst support is in a range from approximately 0.01 mass% to 0.07 mass% (as recited in claim 14) or in the range of approximately 0.01 mass% to 0.04 mass% (as recited in claim 15). Due to such claimed ranges, e.g., CO conversion(s) can be remarkably increased. (See Applicants' drawings, e.g., Fig. 1).

The Sano Patent and the McVicker Patent fail to cure at least such deficiencies of the Frampton Patent, and the Examiner does not contend that they do.

Thus, for at least these reasons, Applicants respectfully submit that the Frampton Patent does not render the subject matter recited in amended independent claims 14 and 15 anticipated or obvious. Claims 15-27 which depend from independent claims 14 and 15 (as appropriate) are also not disclosed by the Frampton Patent for at least the same reasons.

b. Claims 18-20

Each of claims 18-20 depend from claims 14-16, respectively, and also recite that the catalyst support allows the catalyst to have **a fractured or pulverized ratio of at most 10%** when an ultrasonic wave is emitted for approximately 4 hours at a room temperature to the catalyst dispersed in water.

The Examiner attempts to combine the teachings of the Sano Patent with those of the Frampton Patent to teach or suggest the fractured or pulverized ratio of at most 10% when an ultrasonic wave is emitted. Indeed, in the Office Action, the Examiner contends that the specification of the present application discusses the fractured ratio (i.e., the exemplary embodiment thereof) to be the mass% of the particle below 20 microns. Then, the Examiner admits that the Sano Patent fails to teach the mass% of particles below 20 microns. (See Office Action, p. 5, Ins. 11-13). However, the Examiner goes on to allege that it would have been obvious to one of ordinary skill in the art to optimize the catalyst support of the alleged combination of the Frampton and Sano Patents to have a fracture ratio of less than 10% when subjected to an ultrasonic treatment. (See *id.*, p. 5, Ins. 13-16).

Applicants respectfully disagree and assert that even if the Frampton and Sano Patents are combined, the resultant combination in no way teaches or suggests the subject matter recited in claims 18-20.

In particular, as provided in claim 1 of the Sano Patent "(E) after the particles classified in the range of between 53 μm and 75 μm by the sieving method have been subjected to an ultrasonic disintegration treatment at 40 KHz, 35W, for 20 minutes, the proportion of 50 μm or smaller particles, is not more than 30%."

On the other hand, the Examiner referred to the specification of the present application as providing certain example of the mass% of the particles associated with the fracture ration. For example, as provided in paragraph [0037] of Substitute Specification of the present application, when the ratio of particles below 20 μm after fracturing or pulverizing catalysts not containing particles below 20 μm is

over 10 mass%, *there arises a problem in view of the separation of hydrocarbon from the catalyst.*

Accordingly, as recited in claim 18-20 of the present application, **the fractured or pulverized ratio is at most 10%**, and it would not be beneficial and likely problematic to have ratios that are greater than such claimed ratio. Thus, not only the Sano Patent fails to cure the deficiencies of the Frampton Patent to teach or suggest Applicants' invention as recited in claims 18-20, the Sano Patent teaches away from the subject matter recited in these claims since it describes that the proportion of 50 μ m or smaller particles is not more than 30% (i.e., ratios which were indicated as being problematic in the Substitute Specification of the present application).

Thus, for at least these reasons, Applicants respectfully submit that the Sano Patent fails to cure the deficiencies of the Frampton Patent to teach or suggest the subject matter recited in claims 18-20.

c. Claims 28-41 and Claims which depend therefrom

Each of claims 28-41 depend from claims 14-16, respectively, and also recite that **the metallic compound contains iron, cobalt, nickel and/or ruthenium.**

The Examiner admits that the Frampton Patent does not disclose such recited subject matter, but attempts to combine the teachings of the McVicker Patent and the Sano Patent with those of the Frampton Patent to cure these deficiencies of the Frampton Patent. Applicants respectfully disagree, and assert that the alleged

combination of the Frampton, McVicker and Sano Patents does not teach or suggest the subject matter recited in claims 28-41 and the claims which depend therefrom.

In particular, the McVicker Patent describes a catalyst containing 2.2% potassium (alkali metal) and Fe. However, the McVicker Patent has absolutely no disclosure of the **catalyst support** containing such level of potassium and Fe. As clearly recited in claims 24-41 (which depend from amended independent claims 14 and 15), the metallic compound that contains iron, cobalt, nickel and/or ruthenium is in the catalyst support.

Thus, for at least these reasons, Applicants respectfully submit that the McVicker Patent fails to cure the deficiencies of the Frampton and Sano Patents to teach or suggest the subject matter recited in claims 28-41 and the claims which depend therefrom. The claims which depend from claims 28-41 (as appropriate) are also not taught or suggested by the disclosed by the alleged combination of the Frampton, McVicker and Sano Patents for at least the same reasons.

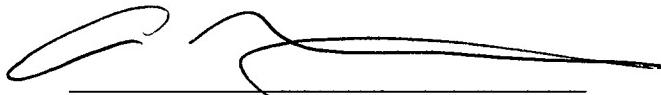
d. Withdrawal of §§ 102(b) and 103(a) Rejections

Applicants respectfully assert that the 35 U.S.C. §§ 102(b) and 103(a) rejections of the pending claims should be withdrawn.

IV. CONCLUSION

In view of the above, it is respectfully submitted that pending claims 14-55 are in condition for allowance. Prompt consideration, reconsideration and allowance of the present application are therefore earnestly solicited.

Respectfully submitted,



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